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India METEOROLOGICAL DEPARTMENT

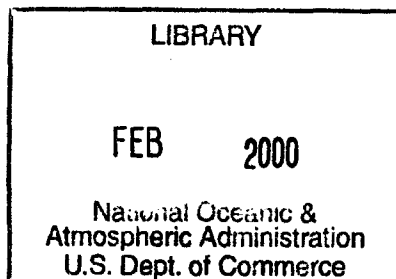
INDIA WEATHER REVIEW, 1951

ANNUAL SUMMARY

PART B

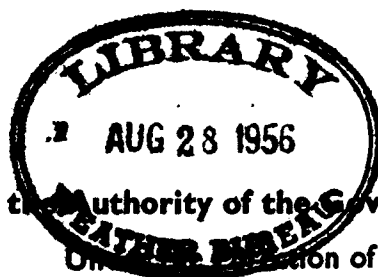
SNOWFALL

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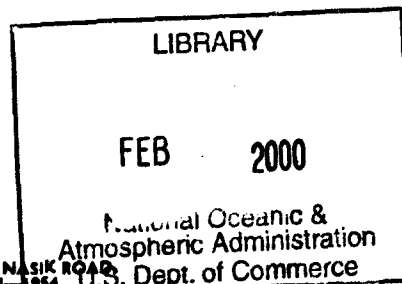
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INDIA WEATHER REVIEW, 1951

ANNUAL SUMMARY

PART B

SNOWFALL

This part contains a summary of the reports of snowfall in the mountain regions to the north of India. These reports are collected by local officers from the local residents, headmen of villages or from travellers who have passed through the region and are then transmitted to this office.

The amount of snowfall is usually measured by finding the depth of undisturbed snow lying on the ground. The measurements are given in feet and inches. At places provided with rain-gauges the snow collected is melted and measured as rain and given in inches and cents.

Winter Period—January and February

I—JAMMU AND KASHMIR

Skardu.—No report was received.

34-26 N 75-46 E

Dras.—There were continuous snowfalls for the major part of January and frequent intermittent falls in February. At the station proper the depth of the falls varied from 6" to 8" in January and 4" to 6" in February. On the surrounding mountains and passes the depth ranged from 1½" to 2½" in January. The snowfall and accumulation were said to be normal.

34-05 N 74-50 W

Srinagar.—There were fifteen light to moderate falls of snow in January and ten in February on the surrounding mountain range of Pir Panjal as well as in the valley. In January, the depth of the falls varied from one to six inches in the valley and one to three feet on Pir Panjal. For February the corresponding depths were 0-10" to 1-50" and one to five ft. The total precipitation recorded at the central observatory amounted to 2-62" in January and 4-88" in February. The heaviest fall of 0-55" (melted snow) was recorded on the 28th and 31st of January. In February the heaviest fall of 1-47" occurred on the 1st. The snowfall was said to be about normal in January and above normal in February. The accumulation of snow at the end of the period on the mountain range of Pir Panjal was reported to be above normal.

34-34 N 76-08 E

Kargil.—There were nine moderate snowfalls in each of the months January and February on the surrounding mountain ranges and passes extending to the station proper. In January, the depth of falls varied from six to nine inches on the mountains and three to five inches at the station proper. In February these ranged from 7" to 11" on the mountains and 4" to 6" at the station. The accumulations on the surrounding mountains which were 3' to 4½' at the end of February were reported to be normal. The snowfall of the period was below average.

Sonemarg.—Snow fell on thirteen days in January and ten days in February. The depth of the falls varied from 0-08" to 2-00" in January and 0-08" to 3-04" in February. The accumulations at the end of the period were seven feet at Sonemarg proper and nine feet on the Zojilla and Nichnay passes. The falls and accumulations were below average.

Gurez Valley.—The total snowfall in the plains of the valley was 3-08" in January and 3-10" in February. In January the accumulations were 5' on ground and 9' on the Rajdani Pass. February recorded 4' accumulations on ground and 8' on mountain ranges. The snowfall during the period was about normal.

Leh.—At the station proper, snow fell on five days in January and on seven days in February. The depth of the falls varied from 0-20" to 0-50" in January and from 0-50" to 1-00" in February. The depth ranged from 6" to 1' on the surrounding hills. The snow-line descended to 12,000 ft. Accumulation on the mountain ranges above 15,000 ft. was estimated to vary from 1' to 3' and 3' to 5' at the end of January and February respectively. Snowfall was below normal in January and normal in February while accumulation at the end of each month of the period was reported to be below normal.

II—PUNJAB (I)

32-34 N 76-08 E

32-32 N 75-57 E

Chamba—Dalhousie Range.—January recorded snowfall on nine days, the total depth amounting to 7' 9". The depths varied from 2" to 1' 10". In February, snow fell on three occasions to a total depth of 5' 7". Individual falls varied from 6" to 3' 1". In January, the accumulation amounted to 10' on Daikund-Basodhan passes and 25' on Sach, Drati and Chobhia passes. In February these were 7' and 25' respectively. The snowfall was normal.

32-06 N 76-10 E

Kangra.—The following table gives the amounts of snowfall and accumulations for January and February in some of the peaks in Kulu sub-division.

Name of Peak	Falls	Accumulation
	(ft.)	(ft.)
JANUARY.—		
Hampta	11-0	14-0
Rhotang	16-0	20-0
Srikhend	5-0	6-0
Raghupur	5-0	5-0
Jullori	3-5	3-5
Lumberi	6-5	6-5
FEBRUARY.—		
Srikhend	6-0	12-0
Raghupur	5-0	9-0
Jullori	7-0	12-0
Lumberi	4-0	8-0

The falls were above average in January and below it in February.

31-31 N 78-11 E

Kilba.—Snowfall during January was light. In February, the falls were much heavier this year than those in previous years.

III—UTTAR PRADESH

29-48 N 76-10 E

Garhwal.—There were seven snowfalls in January and three in February. The depth of snow on the higher altitudes varied from ½' to 8' in January and ½' to 6' in February. The falls were below average during the period.

Tehri-Garhwal.—Snow fell on eight days in January and on three days in February. In January, the depths varied from 3" to 4" on the plains and reached upto 9' on higher elevations. The snow-line descended to a height of 5,000 ft. The depth varied from 2" to 4' in February and the snow-line descended to 4,000 ft. On the higher peaks, the snow accumulations were 8' to 9' in January and about 15' in February. The snowfall during the period was reported to be above average.

Almora.—The following table gives the estimated amount of the falls and accumulations.

Locality	January	February
<i>Falls</i>	(ft.)	(ft.)
falla Darma	2·0	5·0
falla Danpur	10·0	1·5
yans	11·0	9·0
haudans	10·5	2·0
falla Johar	27·0	..
<i>Accumulations</i>		
ankatia Peak	20 to 25	15 to 20
otela Valley	15 to 20	15 to 20
kafini Hill	18 to 28	15 to 20
kafini Valley	20 to 25	20 to 30
ailldhura Peak	25	25
anda Khat	25 to 35	30 to 45
anch Choli Peak	27	..
inder Peak	250 to 300
inder Valley	35 to 45	50 to 60
under Dhunga Valley	22 to 30	35 to 40
under Dhunga Peak	20 to 35	30 to 35

The snowfall during the period was below normal.
Mukteswar.—January had seven falls, the amount of water on melting the snow varying from 3 cents to .55 inches. In February it snowed on three days and the depths varied from 3" to 5½". The falls were above the average.

IV—ASSAM

Snowfall was reported to be slightly below normal in Se La Sub-Agency.

Hot Weather Period—March to May

I—JAMMU AND KASHMIR

Skardu.—No report was received.

Dras.—There were frequent and extensive snowfalls in March and April. The depth of the falls varied from 3" to 7" in March and 2" to 4" in April at the station proper. These were much more on the higher elevations. Six falls accompanied by rain occurred in May. At the station proper, the snow melted away as it fell but the depth of falls on the mountains was estimated to be 2" to 4". Snow accumulations on the surrounding mountains were 6 to 8 ft., 6 ft. and 1½ ft. to 2½ ft. at the end of March, April and May respectively. Snowfall during the period was normal.

Srinagar.—Six light to moderate falls of snow were observed on the surrounding mountain range Pir Panjal in March. Two of these falls also extended upto the

valley. The depths of these falls varied from two to six inches. In April seven light to moderate falls of depth varying from ½ ft. to 1 ft. occurred on the surrounding mountain range Pir Panjal. One light fall was also observed in the valley, the melted amount of this snowfall being 0·05 inches. Four light to moderate falls with depths varying from 2 to 5 inches were observed in May on the surrounding mountain range Pir Panjal. The snowfall and accumulations were reported to be above average for the period.

Kargil.—In March eleven moderate snowfalls occurred on the surrounding mountain ranges and peaks. The depths varied from 3 to 5 inches at the station proper and 5 to 9 inches on higher altitudes. Snow fell on four days in April with depths varying from 2 to 3 inches at the station proper and 5 to 7 inches on higher elevations. May experienced one snowfall with a depth of 1" to 2". The surrounding mountains and passes were entirely covered with snow during the period. The accumulations at the end of March, April and May were 1½ to 2 ft., 1½ to 2 ft. and 6 to 7 ft. respectively. The accumulations were normal and falls were below normal in each of the months March to May.

Sonemarg.—In March there were ten snowfalls, the depths varying from 0·10" to 3·40". April received eight and May three snowfalls, the amounts varying from 0·12" to 2·19" and 0·45" to 2·50" respectively. The snow-line descended up to 5,000 ft. and 7,000 ft. across Zojilla and Nichnay ranges in March and April respectively. The accumulations at the station proper were 7 ft. and 3½ ft. at the end of each of the two months while those on the Zojilla and Nichnay passes were reported to be above 9½ and 5½ ft. respectively. In May accumulations were about 5 ft. on Zojilla and Nichnay passes. The falls were above normal, normal and below normal in the months of March, April and May respectively.

Gurez Valley.—The snowfall amounts were 2½', 1½' and 2½" in March, April and May respectively. The snowfall was below average in each of the months of this period.

Leh.—There were eight snowfalls in each of the months March and April and five in May. These varied from flakes to depths of about one inch in March, about half inch in April and from 1" to 5" in May. The snowfall and accumulation at the end of the period were normal.

II—PUNJAB (I)

Chamba.—*Dalhousie Range*.—Snow fell on four days in March to a total depth of 1' 8". The snow-line descended upto Dalhousie. A fall of 10" occurred in April and the snow-line descended to 7,500 ft. There was no snowfall in May. The snowfall was average for the period.

Kangra.—The average depths of snowfall in March, April and May were 1½', 1' and 1' respectively. The falls were above average in March and nearly so in April and May.

Kilba.—There were heavy snowfalls during March. It snowed in third week of April at places above 9,000'. Light snowfall also occurred in May on the higher elevations.

III—UTTAR PRADESH

Garhwal.—There were five falls in March and one in April. The depth of snow on higher altitudes was ½" to 4" in March and ½' to 1½' in April. The falls were below average in March and above it in April. No report for May was received.

Tehri-Garhwal.—There were seven falls in Rawain and Uttarkashi Tahsils and one in Dhanolly Peshkari during March. On higher elevations above 7,000 ft. the depth varied from 1" to 1'. The depth of snow on the high mountains was reported to be about 2½" in April. Accumulations at such heights were 2" to 2' in March and 1" to 9" in April. The falls were reported to be above average for these months. No report was received for May.

Almora.—The following table gives the amount of falls during and accumulations at the end of each of the months March and May. There was no report for April.

Locality	March	May
<i>Falls</i>	(ft.)	(ft.)
Malla Darma	1½	Nil
Malla Danpur	4½	½
Byans	5½ to 7½	5 to 6½
Chaudans	4	2
Malla Johar	22	..
<i>Accumulations</i>		
Kotela Hill (according to snow pole).	4½	6
Kotela Valley	10	1½
Kafini Hill	2
Kafini Valley	15 to 20	15
Bankatia Peak	15 to 20	12
Pinder Valley	55 to 65	40 to 50
Pinder Peak	255 to 305	150 to 200
Nanda Khat	35 to 50	20 to 45
Sunder Dhunga Valley	40 to 55	25 to 30
Sunder Dhunga Peak	25 to 35	15 to 20
Punch Choli	22	..

The snowfall was about average in March and below average in May.

Monsoon Period—June to September
June and July

I—JAMMU AND KASHMIR

Skardu.—No report was received.

Dras.—It snowed at the station on the 14th June and the thickness was about 2 ft. There was no snowfall in the month of July. The accumulations at the end of June and July on the higher peaks were ten feet and six feet respectively. The falls were above average in June. The accumulations were reported to be above average for the period.

Srinagar.—Three light to moderate falls of snow were observed on the surrounding mountain range Pir Panjal in June. The depths varied from ¼ to ½ inch. There was no snowfall in July. The falls and accumulations were reported to be normal.

^{34-03 N 74-24 E}
Gulmarg.—Two light falls in June and several light to moderate falls were observed in July on the surrounding mountains Handibal and Afarwat. The falls and accumulations were above normal.

Kargil.—One slight snowfall occurred in June to a depth of three inches on the higher elevations. Accumulations varied from six to seven feet and were above normal.

Sonemarg.—Two snowfalls of 0·20" and 0·10" occurred on the 14th and 17th of June respectively at the station proper. It was more on the mountain passes and peaks. There was no snowfall in July. In June the accumulations were three feet on Zojilla and Nichnay hills and about four feet in July. The falls were above average in June.

Leh.—Snow fell on two days in June. The falls varied from flakes to depth of ½ inch. July recorded four snowfalls varying from flakes to depth of 6 inches. In June accumulations ranged from one foot to five feet and were normal. The accumulations were one to two feet in July. Snowfall was normal for the period.

II—PUNJAB (I)

Chamba.—There was no snowfall during this period on Kalatope. Accumulations at the end of June on high elevations were below 2 feet. Above 10,000 ft. six falls were reported in June and three in July. The depth varied in each case from 4" to 8". Accumulations at the end of July on higher elevations were 3' to 4'.

Kangra and Kilba.—No reports were received.

III—UTTAR PRADESH

Garhwal.—Snow fell on four occasions in June in Talla Painkhanda, the depth of which varied from ¼" to 1 foot on higher altitudes. There were five snowfalls in Talla Painkhanda in the month of July. The depth of snowfall on higher altitudes varied from ¼ to ¾ foot. The falls were about normal in June and below normal in July.

Almora.—The following table gives the average falls during and the accumulations at the end of June and July on the well-known passes and peaks. Snowfall for the period was reported to be below average.

Locality	June	July
<i>Falls</i>	(ft.)	(ft.)
Malla Danpur	½	
Byans	2	
Malla Johar	10	
<i>Accumulations</i>		
Kotila Hill	½	
Kotila Valley	1½ to 5	
Kafini Hill	8 to 10	
Kafini Valley	10 to 15	
Bankatia Peak	10 to 15	8 to 10
Pinder Valley	25 to 40	20 to 25
Pinder Peak	200 to 250	180 to 200
Nanda Khat	15 to 25	15 to 20
Sunder Dhunga Valley	12 to 20	10 to 15
Sunder Dhunga Peak	10 to 15	8 to 10
Limpia Ghata	17	
Lipu	10	

August and September

I—JAMMU AND KASHMIR

Skardu.—No reports were received.

Dras.—Snow fell only on the surrounding high peaks and ranges, the depths being 3 inches and 6 inches in the months of August and September respectively.

Srinagar.—Each of the months August and September recorded three light to moderate falls on the surrounding mountain range Pir Panjal. The snowfall and accumulation were reported to be normal.

Gulmarg.—Snowfall occurred on one occasion in August and on several occasions in September which melted almost soon. Falls and accumulations were above average.

Kargil.—No snow fell in August. In September there was a light fall confined to the higher mountain ranges the depths being six inches. Accumulations at the end of the period were 4'. The falls were nearly normal in August and below normal in September.

Sonemarg.—At the station proper there was no snowfall while Zojilla and Nichnay passes witnessed falls of one inch in August. There was no snowfall in September. The depth of accumulations at the end of August on the higher peaks of Zojilla and Nichnay passes was about one foot while there was no accumulation at the end of September. On higher peaks the falls were above the average in August and below in September.

Leh.—Snow fell on two days in August and six days in September. The snow-line was at 17,000 ft. a. s. l. at the end of August and at 13,000 ft. a. s. l. at the end of September. Snowfall was reported to be normal in August and below normal in September.

II—PUNJAB (I)

Chamba—Dalhousie Range.—There was no snowfall during this period on Kalatope.

Chamba—Tissa Range.—Snow fell on five occasions in August and on one occasion in September. Accumulations at the end of August and September were 2 feet and $\frac{1}{2}$ foot respectively. Snowfall was normal in August and below normal in September.

Chamba—Bharmaur.—Snow fell on two occasions in September and accumulations on different passes were as follows:—

Mani Mahesh pass	2"
Kugti pass	24"
Kalichho pass	21"

III—UTTAR PRADESH

Garhwal.—As usual, there was no snowfall in August while September witnessed two falls. Snow fell at heights of 9,000 ft. and above, the depth being 1'. The falls were above average in September.

Almora.—The following table gives the snowfalls during the month and accumulations at the end of each of the months August and September.

Locality	August	September
<i>Falls</i>	(ft.)	(ft.)
Yans	7 to 10	9 to 12½
Kalla Danpur	½
Chaudans	2½
<i>Accumulations</i>		
Botila Hill.	Nil	½
Botila Valley	5 to 7	..
Afani Hill.	6 to 8	8 to 10
Afani Valley	8 to 12	10 to 15
Wali and Phurkia	Nil	Nil
Bankatia	10 to 15	10 to 15
Under Valley	25 to 40	25 to 40
Under Peak	200 to 250	200 to 250
Anda Khat	15 to 25	15 to 25
Under Dhunga Valley	12 to 20	12 to 20
Under Dhunga Peak	10 to 15	10 to 15
Umpia	10	12½
Pu	7	9

Falls were reported to be below average in August and above average in September.

Post Monsoon Period—October to December

I—JAMMU AND KASHMIR

Skardu.—No reports were received.

Dras.—Snow fell at Dras and on the surrounding ranges during all the three months. October had two snowfalls each of depth six inches. In November there was only one snowfall of amount 3" in depth at the station proper while the depth amounted to 2 feet on surrounding peaks and ranges. December witnessed snowfall throughout the last week, the depth reaching 3 feet at the station proper and 6 feet on the surrounding peaks.

Accumulations at the end of each month at the station proper and surrounding mountains were as follows:—

Locality	October	November	December
	(ft.)	(ft.)	(ft.)
Dras Observatory	Nil	Nil	3
Mountains	1	2	6

Snowfalls and accumulations for the period were within the average.

Srinagar.—Each of the months October to December witnessed two light to moderate falls on the surrounding mountain range Pir Panjal. The depths of falls varied between two to four inches in October and did not exceed two inches in November. In December the depth varied from three to six feet. Snowfalls and accumulations were normal.

Kargil.—Three light falls were reported in October on the surrounding mountain range, the depth being 1½ feet. November witnessed one fall the depth being 1 foot on the mountains. In December five falls were reported from the station proper and two from surrounding mountains, the depth being 2 to 4 inches at the station and about 1½ feet on mountains. Accumulation at the end of the period on the well-known peaks was three feet and on ground six inches and was normal. Falls in each of the months were below normal.

Sonemarg.—There was a snowfall in October which extended upto Zojilla and Nichnay passes, the depth being six inches. November reported two falls of depth 1 to 2 feet and 8½" respectively on the above mentioned places. In December it snowed on four occasions, the depth varying from 7½" to 4½". Accumulations at the end of each of the months are given below:—

Locality	October	November	December
Sonemarg	1½"	4"	4½"
Zojilla and Nichnay	5"	6"	6'

The falls were below average in October and nearly average in November and December.

Gurez.—No report was received for October. It snowed on three days in November. December witnessed falls on six occasions the minimum and maximum depths being ½" and 10" respectively. Accumulations were 3 inches and 6 feet for the months of November and December. The falls for the period were below the average of the previous years.

Leh.—It snowed on five days in October, the depths varying from slight to 1 foot on higher elevations. Three falls were reported in November the maximum depth being 5" on higher altitudes. A few light falls were also reported in December. Snowfall was normal in October and November but below normal in December.

II—PUNJAB (I)

Chamba—Dalhousie Range.—No snowfall was reported in October and November. December witnessed falls on two occasions the depths being 8" and 10" respectively. Accumulations at the end of the period at Kalatope was 1½ feet. Snowfall was reported to be about normal for the period.

Chamba—Tissa Range.—In October two falls occurred. In November and December the depths of falls on well-known peaks were as follows :—

Locality	26-11-51	30-12-51	31-12-51
Tissa	Nil	3"	1"
Bara	6 "	1'6"	5"
Khaugu	5 "	1'3"	4"
Sagti	6 "	1'3"	6"
Shoal	5 ½"	1'	6"
Alwas	6 "	1'2"	7"
Devi Kothi	6 "	1'6"	7"

Falls were above normal in October and November and below normal in December.

Chamba—Bhandal Range.—No falls occurred in October while November witnessed a fall of depth ½". Three falls occurred in December the depth varying from 3" to 7". Falls were reported to be above average in November and December.

Kangra.—Snowfall report for October only was received. Falls on the well-known peaks of Kulu and Seraj Tahsils are given below:—

Name of Peak	Depth of snow	Name of Peak	Depth of snow
<i>Kulu Tahsil</i>	(ft.)	<i>Seraj Tahsil</i>	(ft.)
Hemta	10	Siri Khand	3
Dhalog	9	Chal	1
Bersat	8	Ramgarh	1
Bojha Dhar	2	Nahnu	1
Chandar Khani	5	Raghupur	3
Siri	4	Jalari	3
Bhoju	3	Bashbu	½
Majhog	1	Palach	½
		Tirath	3

Mandi—Himachal Pradesh.—There was no snowfall in October. December witnessed two falls, one of negligible depth and other 2" and 3" depth on Thachi and Shayata Galoo respectively. November also witnessed a fall, the depth on different places was as follows:—

Locality	Depth
Smahni Peak	1'6"
Panjain (Rest House)	8"
Bajahi (Rest House) Beas Valley	4"
Kanjira Peak	2'6"
Shikari Peak	3'

Kilba.—No reports were received.

III—UTTAR PRADESH

Garhwal.—There was a snowfall in October the depth higher altitudes being one foot. Three falls were reported in November, the depths of falls varying from ½" to 1". There was no snowfall in December. The falls were just below normal in October and above normal in November.

Tehri Garhwal.—One snowfall of depth from ½" to 1" was reported in December. Accumulation at height of 10,000 has been estimated to be from 1" to 2". Snowfall was reported to be below average.

Almora.—The falls during and accumulations at the end of each of the months are:—

Locality	October	November	December
<i>Falls</i>	(ft.)	(ft.)	(ft.)
Byans	5-6½	5½-7	No report
Choudans	No report	No report	No report
Malla Danpur	½	4-6	3-4
Malla Johar	3	No report	3
<i>Accumulations</i>			
Kotila Hill	½	4½	3
Kotila Valley	6-8	9	9-12
Kafini Hill	10	14	14-19
Kafini Valley	10-12	16-21	19-28
Dwali & Phurkia	½	4½	3-3½
Bankatia	10-15	16-22	14-20
Pinder Valley	25-40	31-46	48-60
Pinder Peak	200-250	206-256	250-300
Nanda Khat	15-25	22-32	30-40
Sunder Dhunga Valley	12-20	18-26	35-40
Sunder Dhunga Peak	10-15	16-22	20-25
Limpia	6	15	11
Lipu	4	10	8

Falls were slightly above normal while accumulations were below normal.

IV.—ASSAM

No reports were received.

Summary

Winter Period, January and February.—Snowfall was slightly above normal in Uttar Pradesh, nearly normal in the Punjab (I) and below normal in Jammu and Kashmir. Accumulations were below normal in Jammu and Kashmir.

Hot Weather Period, March to May.—Snowfall was nearly normal in the Punjab (I) and Uttar Pradesh, and normal in Jammu and Kashmir. The accumulations were slightly above normal in Jammu and Kashmir.

Monsoon Period, June and July.—Snowfall and accumulations were above normal in Jammu and Kashmir.

Monsoon Period, August and September.—Snowfall during this period was as usual, confined to higher elevations and occurred mostly in September. Snowfall in Jammu and Kashmir and Uttar Pradesh was nearly normal. The accumulations were slightly above normal in Jammu and Kashmir and below normal in Uttar Pradesh.

Post Monsoon Period, October to December.—Snowfall was slightly above normal in the Uttar Pradesh and nearly normal in the Punjab (I) and Jammu and Kashmir. The accumulations were nearly normal in Jammu and Kashmir.